

Wintering and Backgrounding Calves

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This NebGuide discusses feeding and management practices for calves that are weaned and backgrounded before entering a feedlot for finishing.

Reasons to Background Calves

Growing or backgrounding weaned calves prior to entering the feedlot for finishing may be done for a variety of reasons:

- To capture value from additional weight gain on the animal.
- To add value to cattle through completion of the weaning process, such as Vac 45 programs, etc.
- To utilize economically available co-products, forages, and crop residues.
- To hold/prepare the cattle for a spring/summer grazing program.
- To develop replacement heifers.
- To grow calves for marketing into a historically more seasonally favorable market.

There are a number of different methods for backgrounding or growing calves after weaning. The method that best meets a producer's goals will depend on a number of factors, including cattle genetics, cattle weight, available feed resources, facilities, future grazing plans, and timing of marketing, to name a few.

Nutritional Considerations of Steers and Heifers

Nutrition is a key factor in the success of a backgrounding program. Once a desired rate of gain has been determined, the diet must be balanced to provide the nutrients necessary to achieve that gain. Achieving the intended gain is critically important to the success of the backgrounding program. Depending on the goal of the program, both calves that gain too little and those that gain too much can impact market time and possibly reduce the profitability of the backgrounding program. The following charts (*Tables I and II*) will help producers determine the nutrient needs for calves to achieve various rates of gain. However, producers should feel free to contact extension personnel for ration balancing assistance.

Table I. Dietary Requirements for 500 lb medium frame steers.

Daily Gain, lb/d	Dry matter Intake (lb/d)	Protein (%)	NEg (Mcal/lb)	TDN (%)	Ca (%)	P (%)
0.5	11.5	8.5	0.25	54.0	0.25	0.17
1.0	12.3	9.5	0.31	58.5	0.32	0.20
1.5	12.8	10.5	0.38	63.0	0.40	0.22
2.0	13.1	11.4	0.44	67.5	0.47	0.24
2.5	13.0	12.5	0.51	73.5	0.56	0.27
3.0	11.8	14.4	0.64	85.0	0.69	0.32

Table II. Dietary Requirements for 700 lb medium frame steers.

Daily Gain, lb/d	Dry matter Intake (lb/d)	Protein (%)	NEg (Mcal/lb)	TDN (%)	Ca (%)	P (%)
0.5	14.8	7.9	0.25	54.0	0.22	0.18
1.0	15.8	8.6	0.31	58.5	0.27	0.18
1.5	16.5	9.2	0.38	63.0	0.31	0.20
2.0	16.8	9.8	0.44	67.5	0.34	0.21
2.5	16.7	10.5	0.51	73.5	0.40	0.22
3.0	15.2	11.7	0.64	85.0	0.49	0.26

Adapted from the NRC 2000.

Producers should note that dry matter intake is higher for larger calves and that the energy density of the diet must increase if higher rates of gain are desired. Dry matter intake must be converted to an “as fed” basis before the actual amount of feed necessary can be determined. For example, if 12.8 lb of dry matter were required and alfalfa hay was the feed source, then 14.4 lb of actual hay would be fed (12.8/.89). This assumes the dry matter of the hay was 89 percent. But if a producer wanted to supplement with 2.5 lb of wet distillers grains (dry matter basis), then 7.1 lb of actual feed would be fed (2.5/.35) because the dry matter of wet distillers grains is only 35 percent.

Byproducts as Feed Resources for Backgrounding Diets

Using byproducts or alternative feeds can reduce the costs associated with backgrounding calves if those products can be purchased and delivered cheaper than traditional feedstuffs. However, certain considerations must be assessed. For example, distillers grains and corn gluten feed, wet or dried, are good sources of protein and energy for growing calves. Additionally, they are high in phosphorus, eliminating the need for additional phosphorus in the mineral supplement. When feeding these byproducts, producers need to have the mineral supplement formulated without additional phosphorus or feed an inexpensive form of calcium such as limestone to make sure the Ca:P ratio is never less than 1.5:1 to prevent urinary calculi (waterbelly). Condensed solubles, another highly palatable byproduct of the ethanol industry, provides a good source of energy and protein, but due to high sulfur content should be limited to no more than 1/3 of total dry matter intake.

Sugarbeet pulp is another byproduct available to producers in western Nebraska. While it is a highly digestible fiber source (76 percent in vitro digestibility, similar to TDN), it is variable in protein (6.6-11.5 percent). Therefore, samples should be sent to a commercial laboratory for analysis prior to feeding. Additional protein sources may be needed to achieve the desired gain. The dry matter content of beet pulp is roughly 24 percent. Therefore, for ease of ration handling, limiting its inclusion to 30 percent dry matter is recommended.

Backgrounding on Forage

There are several approaches for backgrounding cattle on forages depending on the type of forage available. For example, winter annuals such as winter wheat, triticale, or rye can be grazed in the fall, to some extent in the winter, and again in the spring. During the vegetative stage, these forages are > 70 percent TDN and usually contain 18-22 percent CP. As long as forage quantity is good, these forages typically support gains over 2 lb/d. Cool season perennials, such as bromegrass, will support similar gains in the spring. Grazing fall regrowth of subirrigated meadows will generally support gains of 1-1.5 lb/d and contain 12-15 percent CP with TDN ranging from 57-62 percent. Grazing summer annuals, such as sudangrass, foxtail millet, or pearl millet, allows producers to stretch native range resources. Vegetative summer annuals are typically >60 percent TDN and 18-20 percent CP and

usually support gains of 1-1.5 lb/d at the proper stocking rate. Both winter and summer annual hays are also acceptable for backgrounding calves. In the summer, the TDN of native range varies from 68 percent in spring to 52 percent by fall with CP values ranging from 12.8 percent to 8.8 percent. This typically supports gains of 1-2 lb/d. Winter range is typically only 49-52 percent TDN with CP varying from 5 to 7 percent. Therefore, winter range generally must be supplemented with protein to maintain desired gains. Windrow grazing of harvested forages is also an economical approach to supplementing forage for backgrounding calves.

Does It Pay to Background Calves?

Two major components determine the profitability of backgrounding calves:

1. the cost of gain, and
2. the value of gain.

Recently, as feed grain prices have increased, cost of gains for grain-based diets in the feedlot have gone up dramatically. At the same time, the value of gain for backgrounding calves has increased. This increase in the value of gain provides backgrounding programs the potential opportunity to profitably use forage-based programs to grow cattle to heavier weights prior to entering the feedlot for finishing.

The value of gain is calculated by multiplying the projected animal's future weight by projected sale price minus the animal's current value based on weight and estimated sale price. This dollar value is then divided by the number of pounds it is expected to gain from now until the animal is sold which equals the projected “value of gain.”

Example:

Currently, a 550 lb steer at \$1.25 = \$687.50. Six months from now, an 850 lb steer is projected to be worth \$1.15 = \$977.50.

\$977.50	850 lb	
-\$687.50	-550 lb	
\$290.00	300 lb	\$290/300 lb of gain = a projected value of gain of \$0.97/lb.

When the value of the gain for cattle exceeds the cost of gain, there is an opportunity to profit by growing the cattle to heavier weights.

Evaluating Backgrounding/Growing of Calves in a Production System

When considering the potential profitability of growing or backgrounding calves, producers should consider the cost of gain through the whole production system. For example, growing calves through the winter when low average daily gains are combined with low daily feed and care costs may result in actual costs of gain that are fairly high. These high costs of gain may be justified in a production system if additional value can be captured from grazing those calves on spring and summer grass when low costs of gain and compensatory gain may offset winter growing expenses.

Compensatory Gain

A potential benefit of backgrounding calves at a low rate of gain and low cost through the winter is the compensatory gain that can be captured from subsequently grazing high quality forage in the spring and summer. Compensatory gain is a complex process that is not well understood. As a result, compensatory gain on grass is highly variable and hard to predict. A review of research data conducted by University of Nebraska–Lincoln researchers at Nebraska locations showed compensation from cattle on a restricted diet prior to grazing forage ranged from 19–88 percent with a mean of 53 percent. The review also showed that there tended to be a trend in the number of days that cattle were restricted and the amount of compensatory gain that occurred. Longer restriction periods may actually reduce compensatory gain compared to shorter periods of restriction.

Implant Strategies for Backgrounding Growing Calves in a Production System

Growth implants are a tool that producers can effectively use to capture additional performance from growing or backgrounding calves. Typically, implants will return \$5–\$15 dollars worth of gain for every dollar invested in the implant. A variety of implants are available for nursing calves, weaned grazing calves, and finishing cattle. The type of implant that should be used will vary with the expected rate of gain, weight, and sex of the cattle being implanted.

Greater average daily gain benefit is realized when implanted cattle are gaining over 1 lb per head per day. Typically, cattle gaining less than 0.5 lb per head per day experience limited benefit from implants. Also, cattle previously gaining at a low rate of gain will frequently capture additional weight gain (compensatory gain) when they have access to a higher energy diet, thus offsetting the benefit from the implant during the slow gain (wintering) period.

Be aware that implanting heifers that are to be retained for breeding can result in reduced fertility. Be careful to evaluate whether the use of implants will be beneficial in the entire production system. Always use implants according to label instructions.

Ionophores

Ionophores are feed additives that depress or inhibit the growth of specific rumen microorganisms. This selective inhibition alters rumen fermentation in three major ways:

- Improves the efficiency of energy metabolism by changing the types of volatile fatty acids produced in

the rumen and decreasing energy lost during fermentation of the feed. Improved animal performance results from increased energy retention during fermentation in the rumen.

- Decreases the breakdown of feed protein and may also decrease microbial protein synthesis. This has minimal effects on the performance of cattle on high-grain diets, but may have important implications with growing cattle fed high-roughage diets.
- May reduce the incidence of acidosis, grain bloat, and coccidiosis. Reducing these stressors results in improved animal performance.

Calves being wintered or backgrounded on forages are frequently fed an ionophore for its benefit as a coccidiostat to reduce the incidence of coccidiosis. The level of ionophore is also important when cattle are consuming low-quality forage diets. Feeding too high a level decreases the number of cellulolytic bacteria present in the rumen, which can cause reduced fiber digestion. Also, when protein is slightly below the animal's requirement, the ionophore may reduce the breakdown of feed protein and result in a shortage of rumen nitrogen, needed by the rumen microbes for growth. This shortage of nitrogen results in reduced fiber digestion. Thus, the proper level of ionophore depends on the quality of the forage being fed. Producers should know the protein and energy value of feed being fed or grazed to determine the level of an ionophore that should be fed. The effects of ionophores and growth promoting implants are additive and should be routinely used together. Read label directions for use of ionophores in cattle diets.

Summary

Backgrounding calves can be done using several management styles. Facilities, feed resources, and available labor will influence backgrounding decisions. Properly formulating diets for nutrient content and rate of gain, and calculating profitability are critical. Contact local extension personnel for assistance.

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